

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today
(1) was not written for publication in a law journal and
(2) is not binding precedent of the Board.

Paper No. 20

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte MICHEL ALAS, MICHEL GUBELMANN,
and JEAN-MICHEL POPA

Appeal No. 95-4762
Application 08/086,885¹

HEARD: Apr. 5, 1999

Before OWENS, WALTZ, and LIEBERMAN, Administrative Patent Judges.

LIEBERMAN, Administrative Patent Judge.

¹ Application for patent filed July 7, 1993. According to appellants, this application is a division of Application 07/870,773, filed April 21, 1992, now U.S. Patent No. 5,260,456; which is a continuation of Application 07/524,880, filed May 18, 1990, now abandoned; which is a continuation-in-part of Application 07/272,793, filed November 18, 1988, now abandoned.

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DECISION ON APPEAL

This is an appeal under 35 U.S.C. § 134 from the final rejection of claims 1 through 3, 5, 6, 13 through 20 and 29 through 35.

THE INVENTION

Appellants' invention is directed to a method for producing an acid anhydride. One of a select group of acids is contacted with an H⁺ ion treated clay for a period of time sufficient to undergo anhydration. It is a further requirement of the claimed invention that the clay has not been treated with a metal salt. Claim 1 is illustrative of the invention and is reproduced below.

1. A method for producing an acid anhydride wherein said anhydride is glutaric anhydride, succinic anhydride, cyclohexene dicarboxylic acid anhydride, cyclohexane dicarboxylic acid anhydride, phthalic anhydride or pyromellitic anhydride, which method comprises bringing into contact, for a period of time sufficient to produce an acid anhydride, an acid precursor of said anhydride which is to undergo anhydration and a clay having a tetrahedron-octahedron-tetrahedron structure which has undergone one or more treatments by one or more compounds capable of providing an H⁺ ion to the clay and which has not been treated with a metal salt.

THE REFERENCES OF RECORD

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As evidence of obviousness the examiner relies upon the following references:

Pfizer (Britain)	854,999	Nov. 23, 1960
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British Petroleum (PCT)	81/01844	Jul. 9, 1981
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Cram et al. (Cram), "Organic Chemistry," McGraw-Hill, pp. 310-311, (1959).

McCabe et al. (McCabe), "Clay-and Zeolite-catalysed Cyclic Anhydride Formation," J. Chem. Research(S), pp. 356-357, (1985).

THE REJECTIONS

Claims 1 through 3, 5, 6, 13 through 20 and 29 through 35 stand rejected under 35 U.S.C. § 103 as unpatentable over Cram, Pfizer, British Petroleum and McCabe.

OPINION

Having carefully considered the evidence of record before us, we conclude that the examiner has not established a prima facie case of obviousness within the meaning of 35 U.S.C. § 103. Accordingly, we reverse the examiner's decision rejecting claims 1 through 3, 5, 6, 13 through 20 and 29 through 35.

The examiner in his rejection relies upon a combination of four references. No relationship of primary or secondary references has been established by the examiner. In our

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Opinion, each reference is considered individually, in combination with the others and to the claimed subject matter.

Of the four references relied upon by the examiner in his rejection, Cram and Pfizer are directed to well known methods for the formation of anhydrides. Cram is a textbook reference which teaches anhydride formation by heating an acid with an acidic dehydrating agent such as phosphorous pentoxide. There is no disclosure of clay catalyst present.

Pfizer discloses the formation of itaconic anhydride by dehydration of itaconic acid in the presence of sulfuric acid or a monoalkali metal salt thereof. There is likewise no disclosure of clay catalyst being present. We conclude that neither reference is relevant to the claimed subject matter other than providing background information.

British Petroleum and McCabe appear to be the more relevant references. British Petroleum discloses the instant clays of appellants' invention. See British Petroleum pages 2 and 3. As disclosed therein a typical clay, montmorillonite, comprises a central octahedral coordination layer sandwiched between two tetrahedral layers as required by claim 1. The

clay is hydrogen ion exchanged to provide a catalyst for carrying out proton catalyzed organic reactions. British Petroleum states on page 4 that, "[h]ydrogen ion-exchanged layered clays may be used as catalysts in all organic reactions catalysed by protons." Notwithstanding that statement anhydration reactions are not disclosed, although numerous organic reactions are thereafter discussed in pages 4 through 11 and exemplified on pages 11 through 18 of the British Petroleum reference. Accordingly, we find no suggestion in British Petroleum for the use of the acid exchanged clay catalyst in forming the anhydrides of the claimed invention. We conclude that British Petroleum in and of itself is insufficient to teach appellants' claimed process.

Neither do we find any suggestion for combining the teachings of McCabe and British Petroleum. McCabe teaches clay catalysed cyclic anhydride formation. However, in contrast to the claimed subject matter, the clay catalyst used by McCabe is not treated with one or more compounds capable of providing an H^+ ion, i.e., it is not hydrogen ion exchanged.

Rather, it is cation exchanged with a metal salt which could include Al^{3+} , Cr^{3+} and Fe^{3+} . See McCabe, page 356, column 1, lines 4 - 11. In the "Experimental" section in column 1 of McCabe, montmorillonite clay is cation exchanged using aluminum chloride. We conclude that the presence of the cation exchanged clay is a required component of McCabe's disclosure, when clay is used as an anhydridation catalyst. Our position is further supported by Scheme 1 disclosed in column 1, lines 11, wherein McCabe discloses that the reaction studies depicted in Scheme 1 require the presence of Al^{+3} ion containing clay catalyst.

We further conclude that McCabe's clay catalyst is not the clay catalyst of the instant claimed invention. Claim 1 requires a hydrogen ion treated clay which has not been treated with a metal salt. McCabe in contrast teaches a clay which has been treated with metal salt and is not hydrogen ion treated. Furthermore, there is no suggestion in McCabe for the omission of the aluminum salt. Indeed, the entire thrust of McCabe's disclosure is that the Al^{+3} exchanged clay catalyst is the central concept embodied by his disclosure. Therefore,

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McCabe's process in and of itself is insufficient to teach appellants' claimed process.

As to the combination of McCabe and British Petroleum, the examiner in the Final Rejection dated 04/21/94, argues that British Petroleum "equates" the McCabe catalysts with the instantly used hydrogen ion clays. See the paragraphs bridging pages 2 and 3 of the Final Rejection. The examiner further refers therein to the paragraph bridging pages 1 and 2 of the British Petroleum reference in support of his position. We disagree. The portion of the British Petroleum reference relied upon by the examiner discloses that metal cation exchanged montmorillonites will convert alkenes to the corresponding bis-sec-alkyl ethers. It thereafter states: "Although the catalytic activity of a variety of metal cation-exchanged clays is described, there is no disclosure of a hydrogen ion-exchanged clay." Our analysis is that this statement is a mere reflection of the stated prior art. At best, this disclosure of British Petroleum equates metal cation exchanged clays with hydrogen ion-exchanged clays as catalysts for the conversion of alkenes to the corresponding

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bis-sec-alkyl ethers. Accordingly, contrary to the examiner's position, we conclude that this statement in British Petroleum is neither a teaching nor a suggestion that cation exchanged clays and hydrogen ion exchanged clays are equivalent as catalysts for all proton catalyzed organic reactions especially since anhydration reactions are not even disclosed by British Petroleum.

Moreover, our position is supported by and we concur with appellant's argument in his brief that McCabe's anhydration reactions are not equivalent for all acids. See Brief pages 6 to 8. In view of these findings, British Petroleum and McCabe may not be properly combined to arrive at appellants' invention.

In view of our analysis and conclusions, the examiner's legal conclusion of obviousness is not supported by facts. "Where the legal conclusion [of obviousness] is not supported by facts it cannot stand." In re Warner 379 F.2d 1011, 1017, 154 USPQ 173, 178 (CCPA 1967).

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The rejection of claims 1 through 3, 5, 6, 13 through 20
and 29 through 35 as unpatentable over Cram, Pfizer, British
Petroleum and McCabe under 35 U.S.C. § 103 is reversed.

REVERSED

	Terry J. Owens)	
	Administrative Patent Judge)	
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)	
	Thomas A. Waltz)	BOARD OF
PATENT)	
	Administrative Patent Judge)	APPEALS AND
)	INTERFERENCES
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)	
	Paul Lieberman)	
	Administrative Patent Judge)	

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